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From: Robert Puls/ADA/USEPA/US

To: Chris Hill <chris.hill@chk.com>

Delivered Date: 09/29/2011 11:11 AM EDT

Subject: RE: EPA HF Study F2F Meeting

wed 12th

Robert W. Puls, Ph.D.

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▼ Chris Hill ---09/29/2011 08:04:21 AM---Bob, I apologize for taking this long to get back to you, I was trying my best to accommodate your r

From: Chris Hill <chris.hill@chk.com>

To: Robert Puls/ADA/USEPA/US@EPA

Cc: Bert Smith <bert.smith@chk.com>, Cassi Vann <cassi.vann@chk.com>, "cquina@ene.com" <cquina@ene.com>, Debby McElreath <debby.mcelreath@chk.com>, Fonda Manwell <fonda.manwell@chk.com>, 'Gene Florentino' <GFlorentino@ene.com>, "GLukert@ene.com" <GLukert@ene.com>, John Satterfield <john.satterfield@chk.com>, Larry Wooten <larry.wooten@chk.com>, "Mark Hollingsworth (OPER - Regulatory)" <mark.hollingsworth@chk.com>, "MGalloway@ene.com" <MGalloway@ene.com>, Michael Overbay/R6/USEPA/US@EPA, Mike Brownell <mike.brownell@chk.com>, Nancy Coleman <nancy.coleman@chk.com>, Steve Melton <steve.melton@chk.com>, Susan Mravik/ADA/USEPA/US@EPA

Date: 09/29/2011 08:04 AM

Subject: RE: EPA HF Study F2F Meeting

Bob,

I apologize for taking this long to get back to you, I was trying my best to accommodate your request. Unfortunately, a majority of the CHK team will not be available on Oct 5. Could you please propose a alternative date the following week for a F2F meeting?

Chris

From: Puls.Robert@epamail.epa.gov [<mailto:Puls.Robert@epamail.epa.gov>]

Sent: Monday, September 26, 2011 12:19 PM

To: Chris Hill

Cc: Bert Smith; Cassi Vann; cquina@ene.com; Debby McElreath; Fonda Manwell; Gene Florentino; GLukert@ene.com; John Satterfield; Larry Wooten; Mark Hollingsworth (OPER - Regulatory); MGalloway@ene.com; Overbay.Michael@epamail.epa.gov; Mike Brownell; Nancy Coleman; Steve Melton; Mravik.Susan@epamail.epa.gov

Subject: Re: EPA HF Study F2F Meeting

Chris

I will not available on Thu Oct 6. We need to reschedule. Wed oct 5 is OK.

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-----Chris Hill <chris.hill@chk.com> wrote: -----

To: Robert Puls/ADA/USEPA/US@EPA, Michael Overbay/R6/USEPA/US@EPA, "Christopher L. Quina (cquina@ene.com)" <cquina@ene.com>, John Satterfield <john.satterfield@chk.com>, "Lukert, George" <GLukert@ene.com>, "Gene Florentino (gflorentino@ene.com)" <gflorentino@ene.com>, Susan Mravik/ADA/USEPA/US@EPA, Cassi Vann <cassi.vann@chk.com>, Fonda Manwell <fonda.manwell@chk.com>, "MGalloway@ene.com" <MGalloway@ene.com>, Debby McElreath <debby.mcelreath@chk.com>, Bert Smith <bert.smith@chk.com>, Nancy Coleman <nancy.coleman@chk.com>, Larry Wooten <larry.wooten@chk.com>, "Mark Hollingsworth (OPER - Regulatory)" <mark.hollingsworth@chk.com>
From: Chris Hill <chris.hill@chk.com>
Date: 09/26/2011 12:14PM
Cc: Michael Overbay/R6/USEPA/US@EPA, Robert Puls/ADA/USEPA/US@EPA, Steve Melton <steve.melton@chk.com>, Mike Brownell <mike.brownell@chk.com>
Subject: EPA HF Study F2F Meeting
File(s) available for download until 29 September 2016

File: [F2F Meeting Packet v B.pdf](#), 10.19 MBytes
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All,

I appreciate everyone's participation during last Monday's F2F meeting. I thought we had a productive meeting. Please find the meeting minutes below and a link to the meeting packet attached. We did our best to capture the topics of discussion, however, I would appreciate any and all feedback on the minutes. I have scheduled another F2F meeting on Oct. 6 in Ada, OK to continue these discussions and work out the necessary details for the project and associate QAPP.

EPA HF Study Meeting Minutes

(9/19/2011)

9/19/2011 Minutes:

- Attendees
 - CHK: John Satterfield, Chris Hill, Nancy Coleman, Bert Smith, Debby McElreath, Larry Wooten, Mark Hollingsworth, Cassi Vann, Fonda Manwell
 - EPA: Bob Puls
 - E&E: Gene Florentino, George Lukert
- Review Status of Previous Action Items
 - EPA is targeting to finalize the necessary baseline portion of QAPP at the end of September.
 - CHK believes the QAPP should be completed in its entirety prior to conducting any field activities.
 - Verify with Director that EPA analytical methods can be released to outside party (Bob, 9/19/2011 **COMPLETE**) Bob provided EPA methods to CHK at meeting.

- E&E to develop additional design plans for monitoring well location and installation to provide further options for discussion. (Gene, 9/19/2011 **COMPLETE**) Plans were discussed further at meeting and will be outlined in sections below.
- EPA to develop FTP site for all study data and materials and will provide CHK with access. (Bob/Susan, 9/26/2011 **IN PROGRESS**) FTP site is on track to be completed by the end of the week.
- E&E to provide EPA with names and contact information for all parties requiring access to FTP site. (Gene, 9/26/2011 **IN PROGRESS**)
- Tentative Schedule
 - Tentative schedule was provided to the group on Page 3 of the handout packet.
 - General comments included:
 - Dates for sending scope of work to obtain monitoring well construction bids may be too early; based on meeting discussions, exact scope of work for monitoring wells still needs to be developed.
 - **ACTION:** E&E to develop Draft Scope of Work for monitoring well construction. (Gene, 9/26/2011 **IN PROGRESS**)
 - Schedule for produced water (flowback) sampling needs to be included under Completions in the current schedule.
 - **ACTION:** Insert sampling of produced water into schedule (Chris, 9/26/2011 **INPROGRESS**)
- Monitoring Wells
 - Layout
 - Need to do further research to determine if we have sufficient velocity necessary for study. This research includes:
 - Literature/Data Review of the aquifer in this area
 - **ACTION:** E&E to complete Literature search and data review (Gene, 9/30/11 **IN PROGRESS**)
 - Install piezometers (minimum of 5) in the area surrounding the proposed pad to monitor and determine shallow groundwater flow. Conduct monitoring for one (1) week.
 - CHK recommends shallow velocity be determined via a Slug Test, S. Analysis, or Heat Pulse (preferred method).
 - Drill one deep M.W. in selected location (SE corner of proposed pad) to run geophysical tools and characterize the aquifer. This well will have at least a 6" casing.
 - Aquifer characteristics will determine layout of monitoring wells; anticipated M.W. layout includes four (4) 2 to 3-well clusters to monitor both shallow and deep groundwater.
 - Exact locations of these clusters are TBD, but preliminary locations include: one (1) cluster up gradient (near the NW corner of the pad or directly between the existing Bankston pad and our site), one cluster down gradient at the SW corner of the pad, one cluster directly south of the pad, and one cluster at the midpoint of the proposed lateral.
 - **ACTION:** CHK to determine if up gradient cluster can be placed directly between the existing Bankston pad and our site (due to potential space issues). (Chris, 9/30/2011 **IN PROGRESS**)
 - EPA requested additional temporary monitoring wells to test shallow groundwater conditions will be installed on the pad. These wells would be in place for approximately 2-3 months, and be decommissioned after each use. These monitoring wells were requested to be installed during three (3) different phases:
 - One temporary M.W. installed during baseline monitoring
 - One temporary M.W. installed post drilling (but pre-completion)
 - One temporary M.W. installed post completion (or post fracking)
 - **ACTION:** CHK to investigate the feasibility of temporary M.W., included but not limited to plug and abandon procedures and risks of P&A M.W. effecting study. (Chris, 9/30/2011 **IN PROGRESS**)
 - Design
 - E&E to take lead on M.W. design.
 - **ACTION:** Develop draft schematic for M.W. (Gene 9/26/2011 **IN PROGRESS**)
 - Design will be based on LDEQ/LDNR specifications.
 - CHK has noted the need to use pH neutral bentonite grout (recommended Bentonite Gold).
 - EPA recommended Schedule 40 PVC to be used on shallow M.W. (100 feet or less in depth) and with a casing diameter of 2".
 - EPA recommended, for deep M.W. (>100 feet in depth), schedule 80 PVC be used, and casing should be a minimum of 2 ¾" in diameter. (Note: Deep well (for geophysical investigation) should be 6" in diameter when drilled.)

- EPA recommended screening levels will be determined based on geophysical data; screening interval should be less than 20 feet for deep M.W., and 5-10 feet for shallow M.W.; 10 slot should be used on all.
- CHK has noted that a small sediment sump (1 foot sump) should be used.
- Geophysical Techniques
 - Group agrees on geophysical tools to be utilized, with inclusion of CNL-FDC.
 - USGS to provide specifications and procedures for all tools.
 - **ACTION:** Provide geophysical plan and specifications (Bob, 9/30/2011 **IN PROGRESS**)
 - **ACTION:** Incorporate geophysical plan and specifications into QAPP (Gene, 9/30/2011 **IN PROGRESS**)
- Construction
 - Mud rotary be used for M.W. construction, water-based mud will need to be used, and all mud and sand pack will be sampled prior to use.
 - CHK has suggested the looking into the use of air rotary for shallow wells but will need to check with local drillers to verify.
 - Construction Sequence:
 - Will need to verify the sequence with selected contractor.
 - CHK has recommended that trolls be installed in M.W. for continuous monitoring of groundwater conditions.
 - CHK representative will need to be present during M.W. construction for due diligence purposes.
 - Bid Requirements:
 - Standard procedure for EPA is to solicit 3 bids (minimum).
 - Project team will work together to develop the scope of work.
 - **ACTION:** E&E to begin soliciting for proposals from EPA selected drilling contractors. (Gene, 9/30/2011)
 - **ACTION:** CHK to determine cost-sharing of M.W. construction (Chris, 9/30/2011)
 - Group will choose a licensed driller for the State of Louisiana. However, need to verify that the project will not need to be supervised and receive sign-off from a Professional Geologist.
 - **ACTION:** Verify Louisiana state licensing requirements for M.W. construction (Gene, 9/26/2011 **IN PROGRESS**)
 - CHK will obtain all landowner agreements for M.W. locations.
- Security
 - Protective casing will be installed using an agreed upon standard design.
 - In addition, CHK has suggested the use of custody seals on all M.W.
 - CHK has recommended that M.W. casings **NOT** be painted. Protective barriers can be painted to provide visual of M.W. locations.
- Domestic Wells Sampling
 - Agreements
 - Agreements with landowners to sample domestic wells will be pursued jointly by EPA/CHK.
 - Joint letter to send to landowners will be developed.
 - **ACTION:** EPA to provide standard language on the study to insert into letter. (Bob, 9/26/2011 **IN PROGRESS**)
 - **ACTION:** CHK will provide EPA with example of standard Water Supply Survey form. (Mark, 9/26/2011 **IN PROGRESS**)
 - **ACTION:** CHK to contact leasing regarding progress so that letters can be sent to landowners ASAP. (Chris, 9/26/2011 **IN PROGRESS**)
 - EPA suggested "Focus Group" meeting will be held for all interested landowners to explain sampling and the study in more detail. If these meeting take place they will be conducted jointly by EPA/CHK.
 - Procedures
 - EPA stated their intentions to sample all domestic wells used for drinking water within a 1-mile radius of the vertical wellbore and ½-mile from the well lateral. EPA is to only sample **drinking water** sources.
 - **ACTION:** EPA to determine if sampling of area surface waters is necessary (Bob/Gene, 9/30/2011 **IN PROGRESS**)
 - EPA and CHK will split all samples.
 - EPA typically obtains samples using intrusive entry into the domestic wells by utilizing a 1" submersible pump.
 - Domestic wells sampling will be conducted as follows:
 - 3 baseline samples taken, prior to SPUD date

- 3 sample event after drilling of well
- 3 sample event after well completion (fracking)
- **ACTION:** EPA to include SOP for domestic well sampling in QAPP (Gene, 9/30/2011 **IN PROGRESS**)
- CHK has recommended that sampling of turbidity and metals be conducted simultaneously.
- **ACTION:** CHK to provide EPA with dissolved methane technique. (Mark, 9/30/2011 **IN PROGRESS**)
- EPA typically provides landowner with summary of results from sampling of their well.
- **ACTION:** EPA to provide CHK with example of information sent to landowner after sampling. (Bob, 9/26/2011 **IN PROGRESS**)
- Soil Sampling
 - Soil samples should be correlated with soil types for the site.
 - **ACTION:** E&E to obtain soil maps for the county and determine soil types on site. (Gene, 9/30/2011 **IN PROGRESS**)
 - 8-10 soil samples will be taken for each vegetation type for the site (maintained pasture, riparian area of creek).
 - 10 samples will be taken in area of proposed pad. EPA has recommended approximate locations for these samples.
 - 8 samples will be taken in riparian area of nearby creek.
 - Samples will be taken from the A and B Horizons (approximately 3-5 feet deep).
 - CHK has recommended an EM Survey (EM 38) of the site to assist in determining baseline conditions (approximately \$5,000).
 - Sampling of soils around the perimeter of pad will be important to determine any changes in soil chemistry due to fill materials.
 - **ACTION:** CHK to define exact boundaries of pad site and obtain detailed pad construction process (Chris, 9/30/2011 **IN PROGRESS**)
 - All fill material will be sampled prior to installation on site.
- General Notes
 - **ACTION:** EPA to review all CHK comments on QAP, supporting documents and provide response. (Bob, 9/30/2011 **IN PROGRESS**) E&E will then move forward with appropriate revisions.
 - **ACTION:** CHK to resend all names and contact information for CHK personnel requiring access to FTP site. (Chris, 9/20/11 **COMPLETE**) Sent to Susan and Bob 9/23/2011.
 - Updated copy of Tables found in the QAPP was sent to E&E.
 - **ACTION:** E&E to provide updated tables to the group. (Gene, 9/26/2011 **IN PROGRESS**)
 - CHK to review updated tables to see if these tables address any previous questions/comments.
 - Group discussed the need to address "significance" (What is a significant change?) in the QAPP.
 - **ACTION:** EPA to include a definition of "significance" in the QAPP. (Bob/Gene, 9/30/2011 **IN PROGRESS**)
 - Use of incremental filling method will need to be outlined in the QAPP.
 - **ACTION:** Provide EPA with brief procedure for incremental filling method (Chris 9/30/11 **IN PROGRESS**)
 - Develop a draft communication plan (Chris, 9/19/2011 **COMPLETE**) Draft Communication Plan has been provided to group in the meeting handout packet.
 - **ACTION:** Submit comments on Draft Communication Plan (Bob/Gene 9/30/2011 **IN PROGRESS**).
- Meetings
 - Next face-to-face meeting has been tentatively scheduled for October 6, 2011 in Ada, Oklahoma.
 - **ACTION:** Send out invite for 10/6/2011 F2F meeting (Chris 9/23/2011 **COMPLETE**)

Thank you,

Chris Hill

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